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CLAIMS:

1. Method for transporting biological matter to a target site in a closed volume for transplantation purposes, the method comprising the steps of:
 - 5 (a) providing a narrow bore transfer tube having a proximal end and a distal end and containing a biological matter bearing culture medium microvolume, the proximal end connected to a pneumatic system adapted for issuing an outgoing flow of displacement gas into the transfer tube and drawing an incoming flow of displacement gas therefrom for respectively displacing the biological matter bearing culture medium microvolume towards the distal end and away therefrom;
 - 10 (b) issuing an outgoing flow of displacement gas for displacing substantially the entire biological matter bearing culture medium microvolume along the transfer tube for depositing as a biological matter bearing droplet on a surface at the target site and controllably blowing minuscule air bubbles into the biological matter bearing droplet for flattening same on the surface; and
 - 15 (c) monitoring the prevailing pressure within the transfer tube during step (b) for providing real time information with respect to the advancement of the biological matter bearing culture medium microvolume along the transfer tube and its successful deposit as a biological matter bearing droplet at the target site.
2. Method according to claim 1 wherein step (c) includes graphically displaying the prevailing pressure in the transfer tube on a monitor.
- 25 3. Method according to either claim 1 or 2 wherein step (c) includes automatically detecting a fault signature in a pressure waveform acquired during step (b).

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4. Method according to claim 3 wherein step(c) includes automatically detecting at least one of the following fault signatures in the pressure waveform: a fault signature FS1 indicative of a pressure drop during an initial outgoing flow of displacement gas into the transfer tube to displace the biological matter bearing culture medium microvolume towards its distal end; a fault signature FS2 indicative of a pressure increase beyond a predetermined maximum pressure in the transfer tube; and a fault signature FS3 indicative of a pressure increase after an additional outgoing pulse of displacement gas to clean the transfer tube's distal end of any remaining culture medium microvolume.

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5. Method according to claim 3 and further comprising step (d) of automatically issuing a visual and/or aural alarm on detection of a fault signature in the pressure waveform.

15 6. Method according to any one of claims 1 to 5 and further comprising the steps of:

- (e) providing a 2-way valve for selectively connecting the transfer tube to either an uptake catheter with a distal end selectively immersible in a biological matter source or a delivery catheter with a distal end located at the target site;
- 20 (f) providing a venting valve for selectively venting the transfer tube's proximal end to atmospheric pressure;
- (g) providing a culture medium microvolume detection device for detecting the presence of a culture medium microvolume at a predetermined section along the transfer tube;
- 25 (h) selectively immersing the uptake catheter's distal end into the biological matter source and drawing an incoming flow of displacement gas for aspirating a biological matter bearing culture medium microvolume into the uptake catheter;
- (i) removing the uptake catheter's distal end from the biological matter source and drawing an incoming flow of displacement gas for aspirating the biological
- 30 matter bearing culture medium microvolume into the transfer tube;

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- (j) venting the transfer tube on detection of the presence of the biological matter bearing culture medium microvolume therein;
- (k) operating the 2-way valve to connect the transfer tube to the delivery catheter and continuing with step (b); and
- 5 (l) repeating steps (h) to (k) to transport a series of biological matter bearing flattened droplets to the target site.

7. Method according to claim 6 wherein step (h) includes lifting the biological matter source relative to the uptake catheter's distal end for immersing same therein
10 and step (i) includes lowering the biological matter source for removing the uptake catheter's distal end therefrom.

8. Method according to either claim 6 or 7 and further comprising step (m) of providing a micromanipulator for controlling the location of the delivery tube's
15 distal end at the target site.

9. Method according to claim 8 and further comprising step (n) of operating the micromanipulator to gently manipulate the delivery catheter on detection of a fault signature FS2 in the pressure waveform.

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10. Method according to any one of claims 6 to 9 and further comprising step (o) of operating the pneumatic system to issue a second outgoing pulse of displacement gas on detection of a fault signature FS3 in the pressure waveform.

11. Apparatus for transporting biological matter to a target site in a closed volume for transplantation purposes, the apparatus for use with a narrow bore transfer tube having a proximal end and a distal end and containing a biological
5 matter bearing culture medium microvolume, the apparatus comprising:

- (a) a pneumatic system connected to the transfer tube's proximal end and adapted for issuing an outgoing flow of displacement gas into the transfer tube and drawing an incoming flow of displacement gas therefrom for respectively displacing the biological matter bearing culture medium
10 microvolume towards the transfer tube's distal end and away therefrom;
- (b) a control mechanism for controlling the pneumatic system for issuing an outgoing flow of displacement gas for discharging substantially the entire biological matter bearing culture medium microvolume as a biological matter bearing droplet on a surface at the target site and controllably blowing minuscule air bubbles into the biological matter bearing droplet
15 for flattening same on the surface; and
- (c) a pressure sensor for monitoring the prevailing pressure within the transfer tube for providing real time information with respect to the advancement
20 of the biological matter bearing culture medium microvolume along the transfer tube and its successful deposit as a biological matter bearing droplet at the target site.

12. Apparatus according to claim 11 wherein the prevailing pressure in the transfer tube is graphically displayed on a monitor.
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13. Apparatus according to either claim 11 or 12 and further comprising pattern recognition functionality for automatically detecting a fault signature in a pressure waveform monitored during the displacement of substantially the entire biological matter bearing culture medium microvolume along the transfer tube and its
30 depositing on the surface at the target site.

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14. Apparatus according to claim 13 wherein the pattern recognition functionality is capable of automatically detecting at least one of the following fault signatures in the pressure waveform: a fault signature FS1 indicative of a pressure drop during an initial outgoing flow of displacement gas into the transfer tube to displace the biological matter bearing culture medium microvolume towards its distal end; a fault signature FS2 indicative of a pressure increase beyond a predetermined maximum pressure in the transfer tube; and a fault signature FS3 indicative of a pressure increase after an additional outgoing pulse of displacement gas for cleaning the transfer tube's distal end.

15. Apparatus according to claim 13 wherein the pattern recognition functionality is capable of automatically issuing a visual and/or aural alarm on detection of a fault signature in the pressure waveform.

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16. Apparatus according to any one of claims 11 to 15 and further comprising:

- (d) a 2-way valve for selectively connecting the transfer tube to either an uptake catheter with a distal end selectively immersible in a biological matter source or a delivery catheter with a distal end located at the target site;
- (e) a venting valve for selectively venting the transfer tube's proximal end to atmospheric pressure;
- (f) a culture medium microvolume detection device for detecting the presence of a culture medium microvolume at a predetermined section along the transfer tube;

25 wherein the control mechanism is programmed to:

- i) selectively immerse the uptake catheter's distal end into the biological matter source and draw an incoming flow of displacement gas for aspirating a biological matter bearing culture medium microvolume into the uptake catheter;

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- ii) remove the uptake catheter's distal end from the biological matter source and draw an incoming flow of displacement gas for aspirating the biological matter bearing culture medium microvolume into the transfer tube;
- 5 iii) vent the transfer tube on detection of the presence of the biological matter bearing culture medium microvolume therein;
- iv) operate the 2-way valve to connect the transfer tube to the delivery catheter;
- v) control the pneumatic system for issuing an outgoing flow of
- 10 displacement gas for discharging substantially the entire biological matter bearing culture medium microvolume as a biological matter bearing droplet on a surface at the target site and controllably blowing minuscule air bubbles into the biological matter bearing droplet for flattening same on the surface; and
- 15 vi) repeat steps (i) to (v) to transport a series of biological matter bearing flattened droplets to the target site.

17. Apparatus according to claim 16 and further comprising a lifting device for lifting the biological matter source relative to the uptake catheter's distal end for

20 immersing same therein and lowering the biological matter source for removing the uptake catheter's distal end therefrom.

18. Apparatus according to either claim 16 or 17 and further comprising a micromanipulator for controlling the location of the delivery tube's distal end at the

25 target site.

19. Apparatus according to claim 18 wherein the control mechanism operates the micromanipulator to gently manipulate the delivery catheter on detection of a fault signature FS2 in the pressure waveform.

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20. Apparatus according to any one of claims 16 to 19 wherein the control mechanism operates the pneumatic system to issue a second outgoing pulse of displacement gas on detection of a fault signature FS3 in the pressure waveform.
- 5 21. A guide catheter for use with a delivery catheter having an external diameter D, the guide catheter having a longitudinally directed lumen with a multitude of longitudinally directed supports with longitudinally directed inner facing surfaces for slidably supporting the threading of the delivery catheter through the guide catheter whereby the longitudinally directed supports assume the appearance of the
10 spokes of a wheel in a transverse cross sectional view of the guide catheter with the delivery catheter threaded therethrough.
22. The catheter according to claim 21 wherein the inner facing surfaces are curved so as to define an imaginary circle having a diameter slightly greater than
15 the delivery catheter's external diameter D.
23. For use with a pneumatic system capable of issuing an outgoing flow of displacement gas and drawing an incoming flow of displacement gas, and a biological matter source, a tubing set for transporting the biological matter from the
20 biological matter source to a target site in a closed volume for transplantation purposes, the tubing set comprising a 2-way valve having three ports, a transfer tube having a proximal end connected to the pneumatic system and a distal end connected to a first port of the 2-way valve's three ports, an uptake catheter having a proximal end connected to a second port of the 2-way valve's three ports and a
25 distal end selectively immersible in the biological matter source, and a delivery catheter having a proximal end connected to the third port of the 2-way valve's three ports and a distal end for location at the target site.

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24. The tubing set according to claim 23 wherein the transfer tube has a tube segment adapted for being hermetically connected to a pressure sensor for monitoring the prevailing pressure in the transfer tube.
- 5 25. The tubing set according to either claim 23 or 24 wherein the transfer tube has a tube segment adapted for being hermetically connected to a venting valve for venting the transfer tube to atmospheric pressure.